

Corn, Carbon, and COVID - Challenges and Opportunities for Agriculture after 2020

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Ag Lenders Conference

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2020's Short and Long-term Impacts on Agriculture and Energy

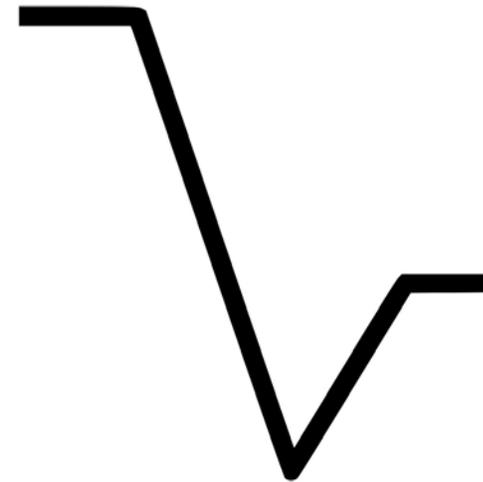
Economic and Social Disruption

Economic Recovery

Energy Transition

Covid as Accelerator

Changing priorities



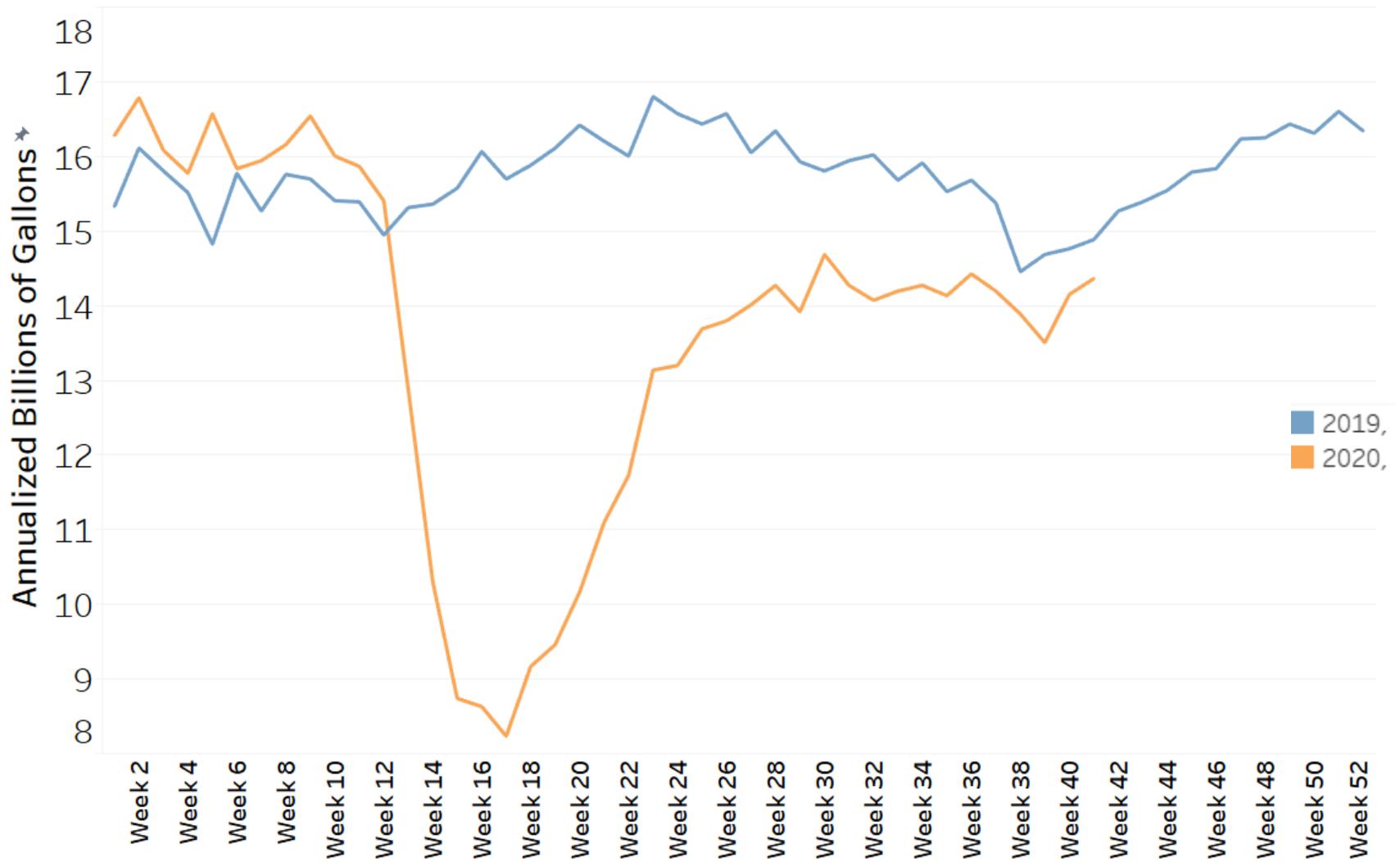
Ethanol – Key Factors

Short and Long-term Uncertainty Domestic Gasoline Demand

Permanent Plant Retirement (Shuttering)

Lower Corn Supplies

US Ethanol Production 2019/2020

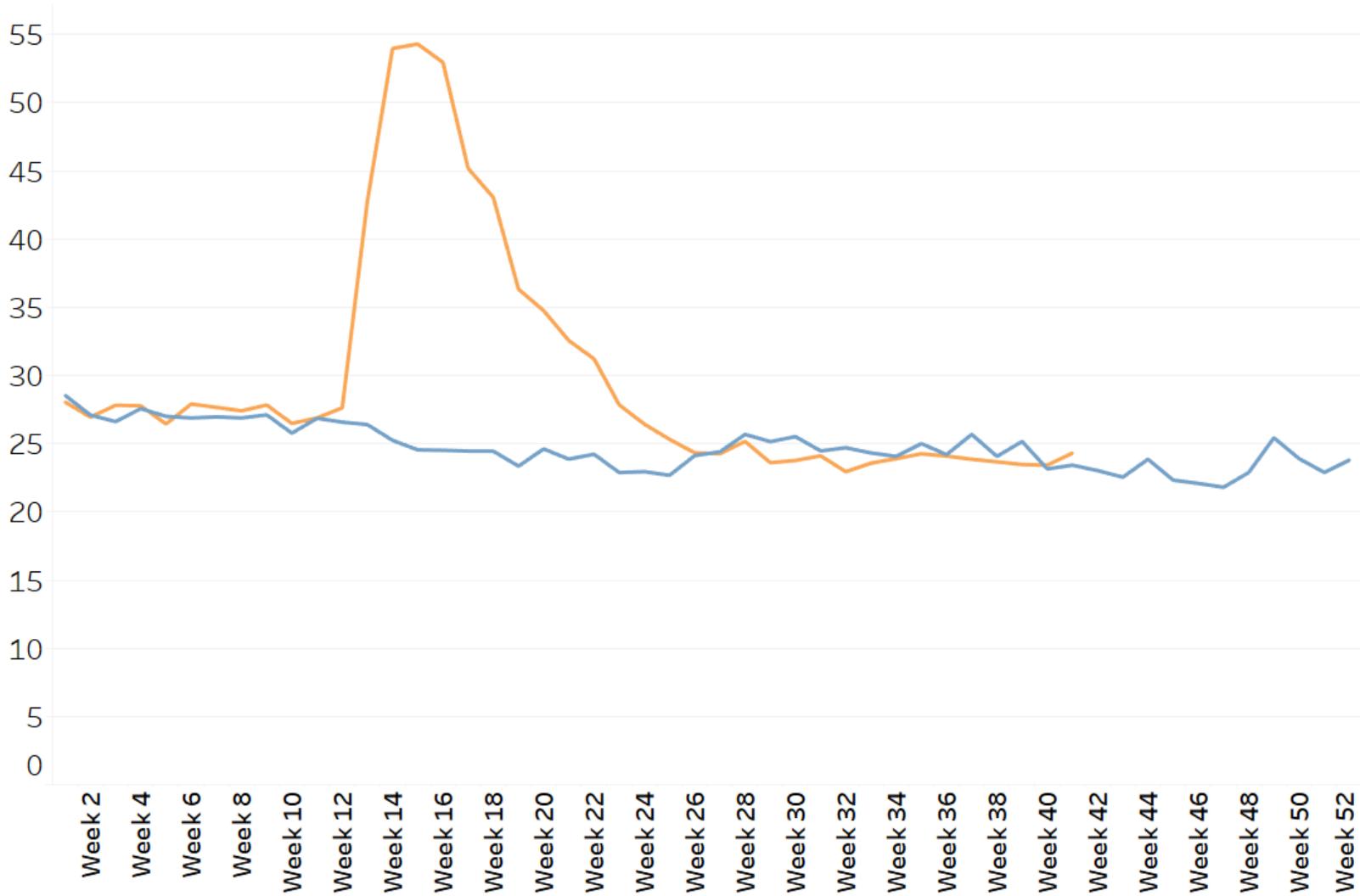


Data: EIA



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US Ethanol Days in Storage, 2019/2020

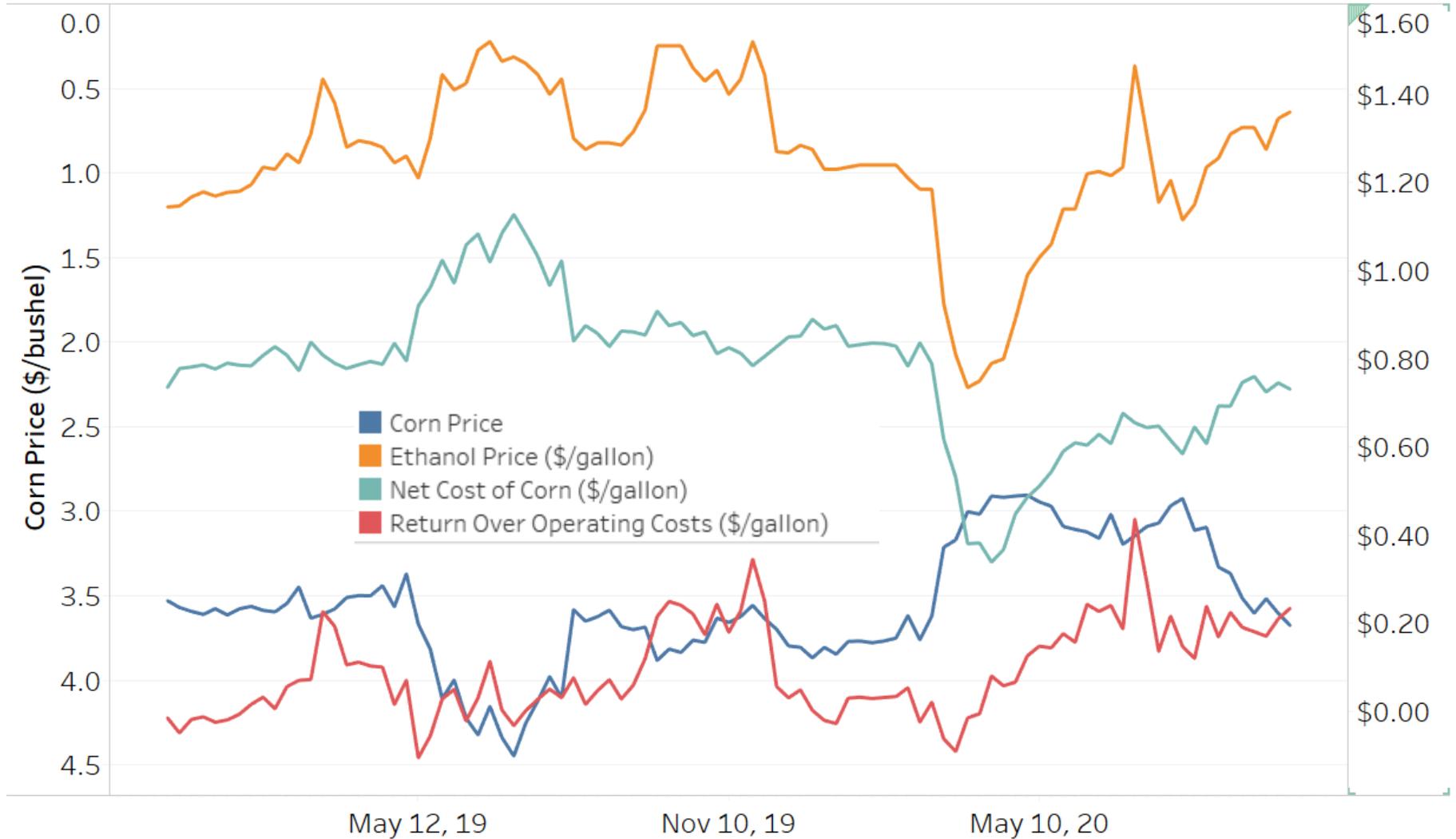


Data: EIA



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US Corn-Ethanol Margins, 2019/2020



Data: Iowa State University



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Ethanol - Points

Renewable Fuel Standard

Small Refinery Waivers –

If 15 billion gallons is the number and gasoline use doesn't increase – then we'll need higher blends

E15

California Low Carbon Fuel Standard



California has assumed international leadership

Nation's largest transportation fuel market (~10% of the total)

Goal: Reduce the Greenhouse gas emissions associated with transportation

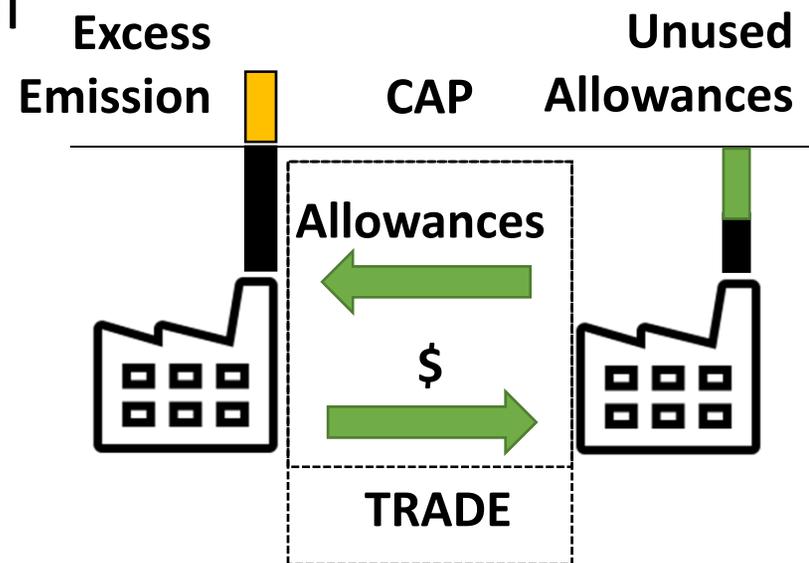
Uses a Cap and Trade system

Works, legally tested, "built" and is serving as a model for other states and nations

Cap & Trade

Beyond setting strict limits on emissions, the establishment of cap & trade systems

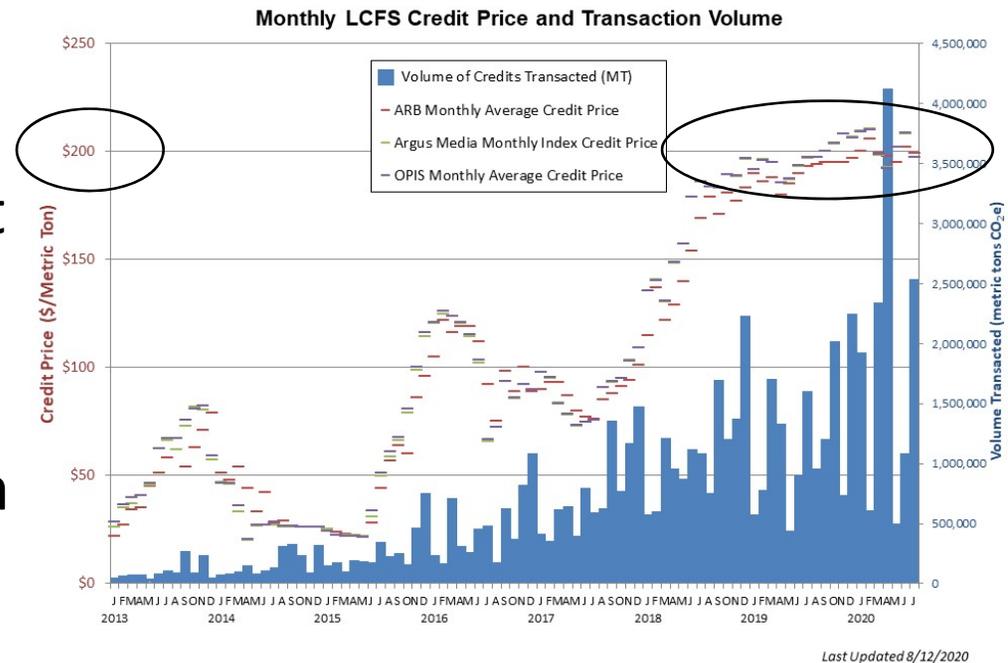
- Limit undesired behavior or outcomes
- Allow firms to find the best solutions
 - which could be trade alone
 - but could also be innovation!



The Price of Carbon

The price of carbon credits has averaged \$200 per MT for the last two years.

A one percent reduction in GHG emissions can in result in the “creation” of credits equal about 1¢ per gallon.



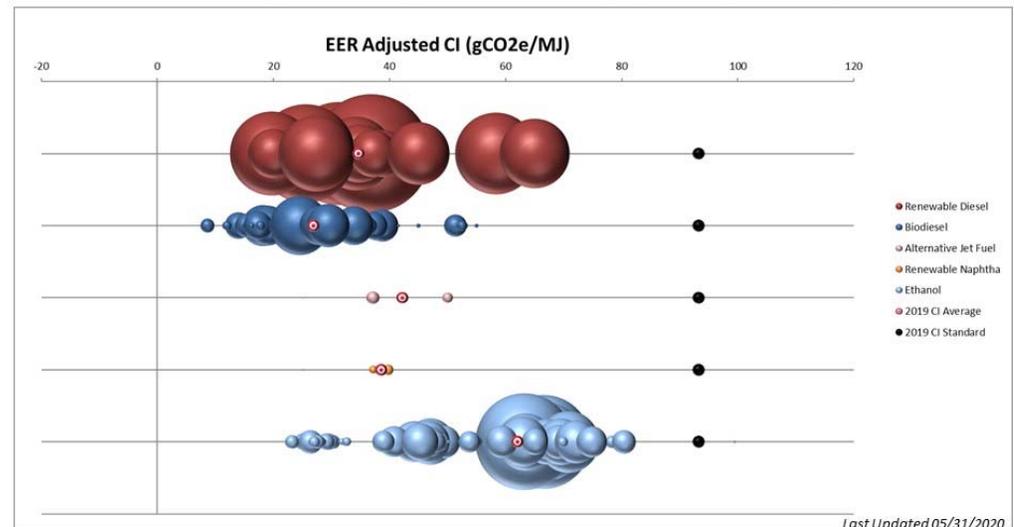
This chart tracks credit prices and transaction volumes over time. Monthly average credit prices reported by Argus Media and OPIS [used with permission] are shown along with CARB monthly average price.

LCFS Impacts: US Corn Ethanol

Increased demand, as it is a low-carbon fuel (although still almost universally marketed as E10)

Major investments in carbon and energy reducing technology

2019 Volume-weighted Average Carbon Intensity by Fuel Type for Liquid Fuels



This figure provides perspective on the performance of actual quantities of fuel consumed in California. Each sphere represents a certified fuel pathway; the size of the sphere represents the reported volume of the fuel in 2019, while its position on the horizontal axis indicates the carbon intensity of that fuel.

The alternative fuel's CI value is divided by its Energy Economy Ratio (EER) in order to obtain the EER-adjusted CI value, representing the emissions which occur from the alternative fuel per MJ of conventional fuel displaced.

LCFS Future Impacts

There is tremendous interest in modeling feedstock emissions (read corn ethanol).

Building even stronger relationships between ethanol refiners and feedstock suppliers (corn farmers)

Businesses don't compete, supply chains compete

Revisiting a variety of advanced biofuel pathways

CCUS

Given the high price of carbon, there are projects across the globe looking at ways to capture use/sequester carbon.

Among the highest profile is Project Tundra that is looking to manage carbon emissions from MinnKota Power's Milton Young Station

Blue Flint Ethanol (near Underwood) is looking to do the same as is Red Trail Ethanol.

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New carbon capture project could help corn growers



carbon capture project could help corn growers (KFYR-TV)

By [Morgan Benth](#)

Published: Oct. 18, 2020 at 3:59 PM CDT | Updated: 14 hours ago



BISMARCK, N.D. (KFYR) - A new carbon capture project across from the Blue Flint et

Renewable Diesel

The recent price of renewable diesel in California is _____.

Renewable diesel is biofuel produced using various bio-based feedstocks (vegetable oil, grease, fat) and traditional crude oil refining processes.

Meets diesel spec. Has an extremely low carbon footprint.

Proposal would convert Dickinson oil refinery to renewable diesel

AMY DALRYMPLE Bismarck Tribune Aug 1, 2018

SALE! Subscribe for \$1/mo.



The Andeavor Dickinson Refinery is located 4 miles west of Dickinson.

FORUM NEWS SERVICE, 2014 FILE PHOTO

How to Get Rid of Carbon Emissions: Pay Farmers to Bury Them

'Regenerative growing practices' sequester in the soil carbon released from burning fossil fuels



U.S. Farmers on China Tariffs: 'This Isn't Just a Chess Match'

The trade war with China is putting a strain on the U.S. agriculture industry. WSJ's Jason Bellini sat down with a group of farmers from the corn, beef, soybean, and dairy industries to hear how tariffs are affecting their businesses.



By [Greg Ip](#)

Sept. 11, 2019 10:24 am ET

Wall Street Journal, September 11, 2019

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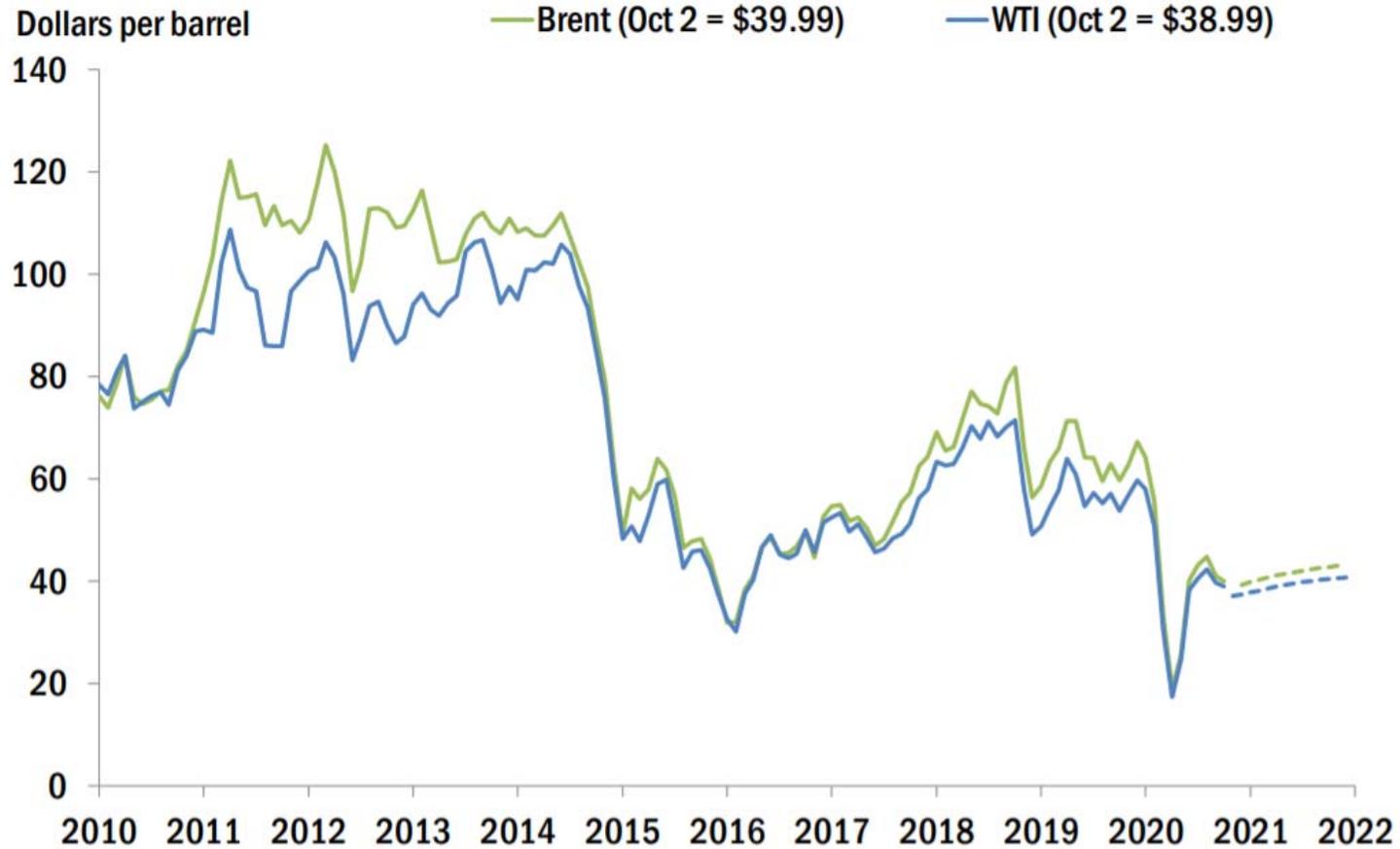
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Definitions

Ecosystem Services – benefits from interactions between people other organisms and the environment. Includes a variety of products such as food, fuel, and fiber; services like recreation and tourism, as well as carbon sequestration and erosion control.

Ecosystem Service Markets – an institution where goods and services are bought and sold.

WTI & Brent Crude Oil



Federal Reserve Bank of Dallas

NOTES: Latest prices are averages for the week ending 10/2/20.
Dashed lines are forward curves. WTI is West Texas Intermediate.
SOURCES: Bloomberg; Energy Information Administration.

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Chart 1 Breakeven for New Wells Averages Just Below \$50 Per Barrel in Dallas Fed Survey



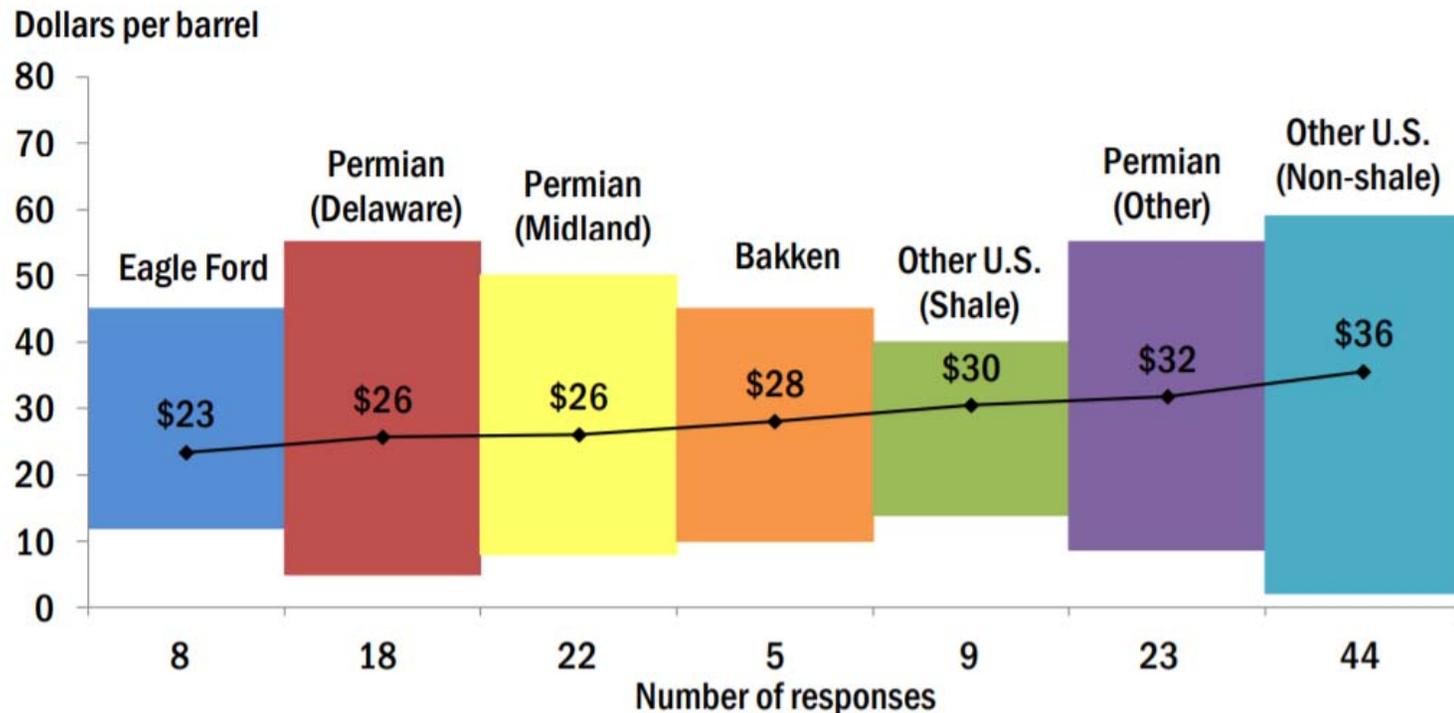
NOTES: The question posed to executives was: "In the top two areas in which your firm is active, what WTI oil price does your firm need to profitably drill a new well?" Lines show the mean, and bars show the range of responses. Executives from 92 exploration and production firms answered this question during the survey collection period, March 11–19, 2020.

SOURCE: Federal Reserve Bank of Dallas.

Federal Reserve Bank of Dallas

Shut-in Prices for Existing Wells

Dallas Fed Energy Survey—In the top two areas in which your firm is active: What WTI oil price does your firm need to cover operating expenses for existing wells?



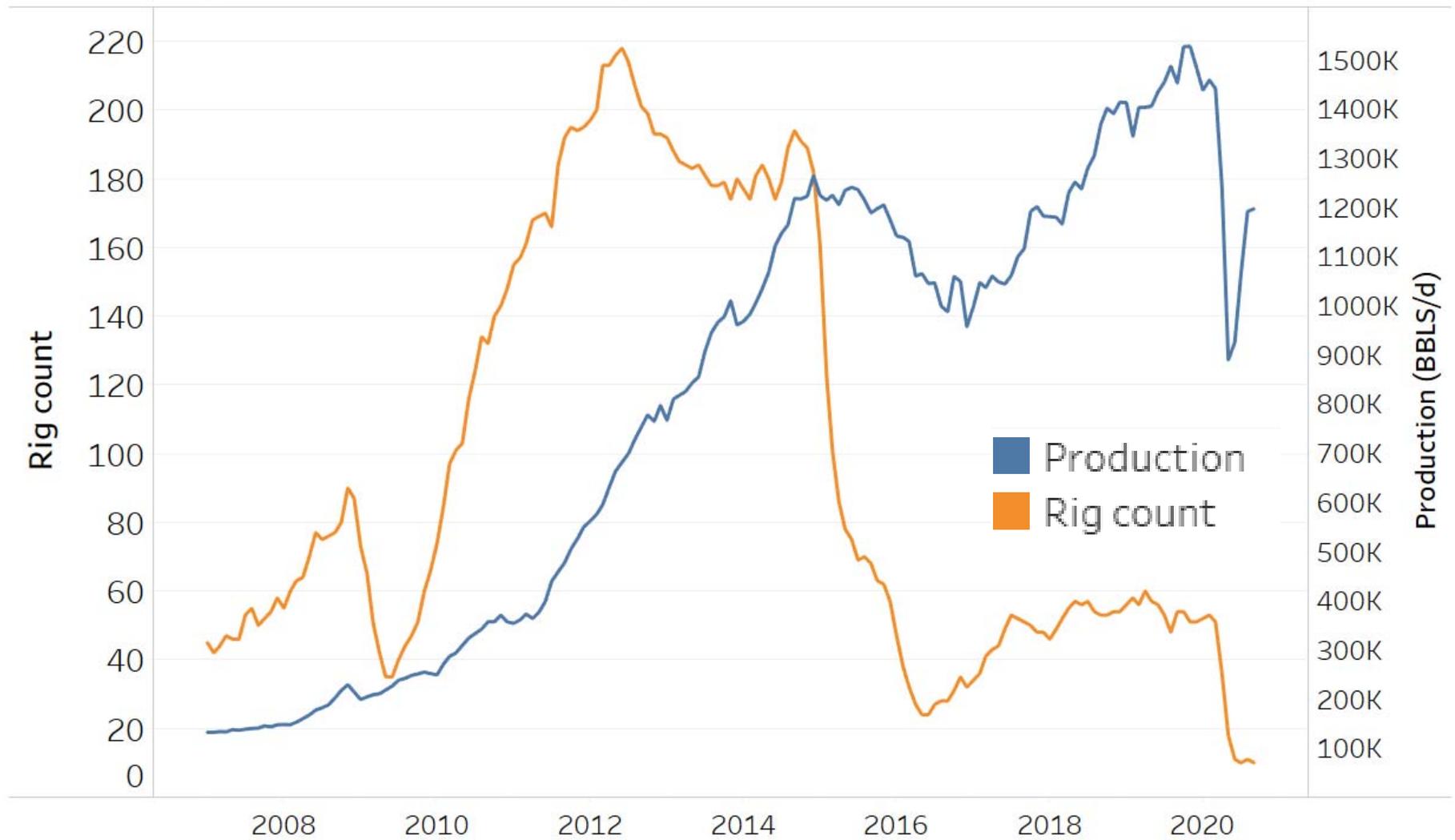
Federal Reserve Bank of Dallas

NOTES: Line shows the mean, and bars show the range of responses.
95 E&P firms answered this question from March 11-19, 2020.
SOURCE: Federal Reserve Bank of Dallas.

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ND Monthly Oil Production and Rig Count



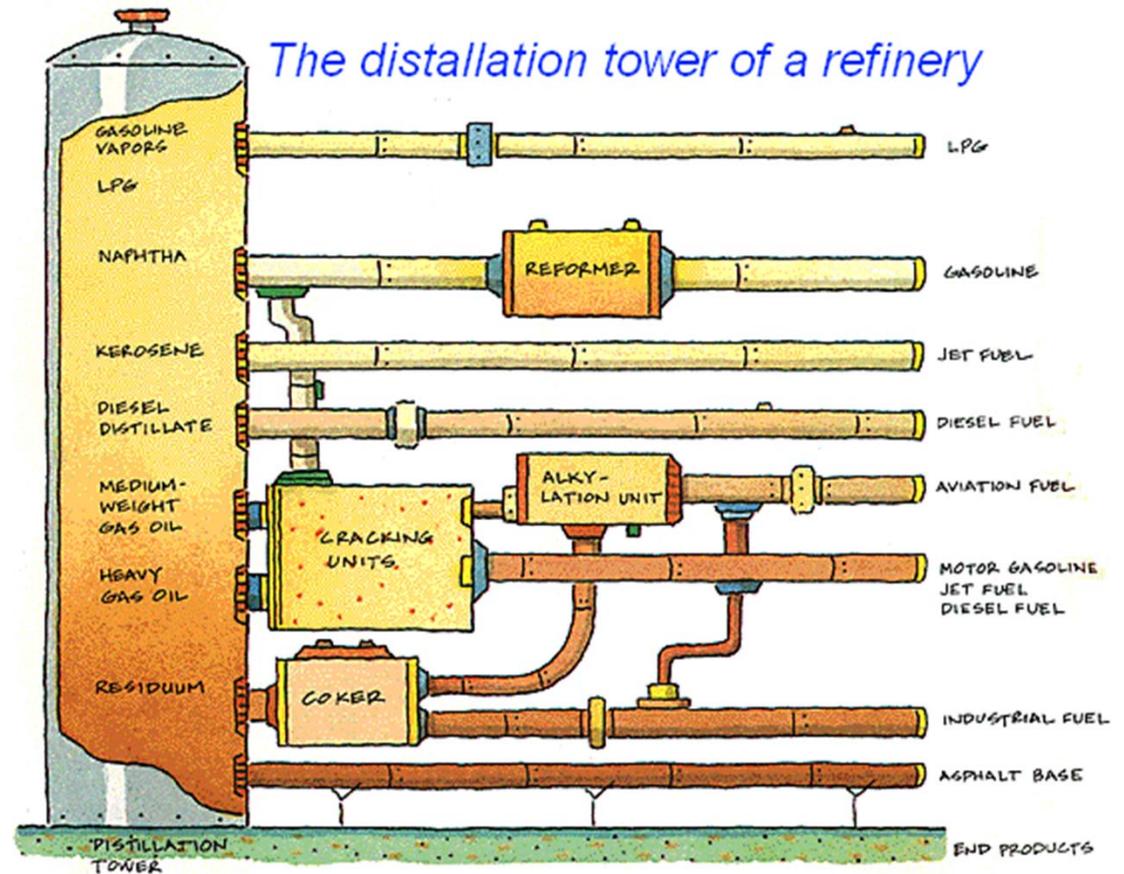
Data: EIA

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Crude Oil Crack and Spring 2021 Diesel

Gasoline and diesel demand has recovered since the spring, but jet fuel has not. This fuel is being refined to diesel distillate raising supplies.



What next?

When/how do incomes of marginalized labor force recover?

What priorities/consensus (if any) will Washington have in 2021?

Will the dollar weaken and if so will commodities and agriculture benefit?

How does ND take advantage of carbon/ecosystem service markets?

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